SUMMARY

Title: Geophysical survey for deep geothermal energy exploitation at the site Nova Paka

Author: Magda Karousová

Supervisor: Prof. RNDr. Miloš Karous, DrSc.

Supervisor's e-mail address: karous@geonika.com

The topic of this thesis is a literature search of geological, geophysical, and geothermal information about wider surroundings of the area of Nova Paka and a complete geophysical survey focused on mapping of deeper fault zones and verification of Permo-Carboniferous sediments thickness.

The area has been preliminarily assessed as promising for the use of deep geothermal energy. It belongs to the south-western part of Krkonoše Piedmont Basin. The bedrock of the basin is formed by Proterozoic metamorphites. Heating of surrounding rocks by intrusions of local volcanics during the Younger Tertiary is considered important for geothermal applications. The cover of metamorphic bedrock by sediments may indicate accumulation of the heat from the bedrock at relatively shallow depths of several hundred meters. Geophysical measurements, namely reflection and refraction seismics, gravimetry and resistivity profiling identified two major fault zones of east-west and northwest–southeast direction. The interpretation of the data obtained by geophysical sounding methods, namely seismic reflection and vertical resistivity sounding, showed that the average thickness of Permo-Carboniferous sediments is about 500 m. The thickness of the basin increases northwards and towards the north-west along its axis.

Geophysical survey confirmed that the area of interest is promising for exploration of geothermal energy and provided basic parameters for further prospecting and for locations of deep geothermal wells.

Keywords: geophysical survey, geothermal energy, HDR method, Krkonoše Piedmont basin